REMARKS UNDER 37 CFR § 1.111

Formal Matters

Claims 22, 24-31, 33-39, 49, 51-58, 60-67, 69-76, 78-84, 103, 105-113, 115-118, 121-123, 125-128, 131-145 are pending after entry of the amendments set forth herein.

Claims 22, 24-31, 33-40, 42-49, 51-58, 60-67, 69-76, 78-85, 87-94, 96-103, 105-131 were examined and were rejected. No claims were allowed.

Claims 40, 42-48, 85, 87-93, 94, 96-102, 114, 119, 120, 124, 129, and 130 have been canceled without prejudice to renewal, without acquiescing to any rejection that may have been applied to the claims, and without intent to abandon any subject matter encompassed by the canceled claims. Applicants expressly reserve the right to file one or more subsequent applications directed to the subject matter of these canceled claims.

Claims 49, 51, 58, 60, 67, 69, 103, 105, 125, 126, 127, and 131 have been amended. Support for these amendments is found throughout the specification and in particular at: page 8, line 26 through page 9, line 24.

New claims 132-145 have been added. Support for these new claims is found throughout the specification and in particular at: page 8, line 26 through page 9, line 24.

Please replace claims 22, 24-31, 33-39, 49, 51-58, 60-67, 69-76, 78-84, 103, 105-113, 115-118, 121-123, 125-128, 131-145 with the clean version provided above.

Replacement pages 131, 132, 634-637, and 639-652 have been provided. The attached replacement pages simply correlate the clone names with the appropriate cDNA library. The subject matter of the replacement pages is found in pages 131, 132, 591-594, and 639-652 of International Publication WO 99/38972 (International Application No. PCT/US99/01619), of which the present application is the National Phase application under 35 U.S.C. §371.

[redacted]

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

Applicants respectfully request reconsideration of the application in view of the amendments and remarks made herein.

No new matter has been added.

Specification

Withdrawn Objection to the Specification

Applicants gratefully acknowledge the Examiner's entry of missing page 638 into the specification and withdrawal of the objection to the specification for this matter.

Insertion of Substitute Pages into the Specification

The Office has indicated that substitution of pages 131, 132, 591-594, and 638-652 has been held in abeyance until such time that Applicants clarify the reasons for the insertion of the substitute pages.

Applicants first note that they had not requested entry of pages 131, 132, 591-594, and 638-652 provided with the response to the previous Office Action but, with the exception of page 638, had requested only that the Office verify that these pages had been entered into the specification of PCT/US99/01619 (published as WO 99/38972) and therefore also the instant specification. Applicants had wished to ensure that these pages containing the ATCC deposit numbers, which were filed with the U.S. Receiving Office on March 19, 1999 along with a Request to Record References to Biological Materials under Rule 13bis, were properly in the specification of the application currently being examined.

Examiner Interview Summary

Applicants thank the Examiner for the telephonic interview on March 20, 2002, in which the specification of the instant application and that of International Publication WO 99/38972 were compared to the previously submitted substitute pages. This inspection revealed that substitute pages 131, 132, 591-594, and 639-652 were not present in the application currently being examined, but were present in WO 99/38972. The inspection also revealed that pages 591-594 (Table 21) substituted into

the specification of WO 99/38972 were erroneously numbered – these pages were intended to be a replacement of pages of Table 21 found at pages 634-637 of the originally filed PCT application.

Provision of Replacement Pages

As such, Applicants provide herewith replacement pages 131, 132, 634-637, and 639-652 to be entered into the specification of the instant application, which replacement pages contain the subject matter of substitute pages 131, 132, 591-594, and 639-652, filed on March 19, 1999, with the U.S. Receiving Office and published in WO 99/38972. Applicants have corrected the page numbering of Table 21 from pages 591-594 to pages 634-637. The following table provides correlation between the replacement pages provided with this response and the pages of WO 99/38972 containing the subject matter of these replacement pages.

Replacement Pages Submitted Herewith	Location of Subject Matter in PCT WO 99/38972
131	131
132	132
634-637	591-594
639-652	639-652

As can be seen from the table above, the entry of replacement pages 131, 132, 634-637, and 639-652 does not add new matter to the instant specification. Accordingly, Applicants hereby request entry of replacement pages 131, 132, 634-637, and 639-652 into the instant specification.

Rejection under 35 U.S.C. §§101 and 112, first paragraph

The rejection of claims 40, 42-48, 58, 60-66, 85, 87-94, 96-102, 114, 116, 119, 120, 124, 126, 129, and 130 under 35 U.S.C. §§101 and 112, first paragraph, has been maintained. In response to Applicants' arguments filed in response to the original rejection, the Office Action stated:

> Applicant's arguments filed 04 June 2001 have been fully considered but they are not persuasive. The applicants state that sequences that are not differentially expressed in tumor cells have utility, but no specific and substantial utility for SEQ ID NOS:329, 1186, 1938, and 1998 (to which the claims are drawn) are proposed by the applicants in their comments.

The previous Office Action has noted that SEQ ID NOS: 65, 253, 1780, 1899, and 2007 have a disclosed specific utility as a diagnostic since the specification establishes that they are differentially

expressed in cancer cells. Applicants also note that, in view of a Declaration under 37 C.F.R. §1.132 submitted by Applicants showing differential expression of SEQ ID NO: 739 in colon cancer cells relative to normal colon cells, the Office has withdrawn a similar rejection of claims 49 and 51-57.

Claims 40, 42-48, 85, 87-102, 114, 119, 120, 124, 129, and 130 have been canceled, thus rendering moot the rejection of these claims. Applicants note that these claims are canceled solely to facilitate prosecution, without acquiescing as to the correctness of the rejection, and without intent to give up any of the subject matter contained therein. Applicants expressly reserve the right to file one or more subsequent applications directed to the subject matter of these canceled claims.

Regarding claims 58, 60-66, 116, and 126, Applicants have attached a Declaration under 37 C.F.R. § 1.132 by Dr. Randazzo and Dr. Lamson, providing evidence that SEQ ID NO: 1186, to which these claims are directed, represents genes that are differentially expressed in cancer cells (see Exhibit 1). Therefore, it follows that a polynucleotide having a sequence of SEQ ID NO: 1186 also has a specific utility as a diagnostic.

In short -- and to summarize in a simplified manner-- the claimed polynucleotides represent genes differentially expressed in cancerous cells and/or represent genes expressed in a cancerous cell (*e.g.*, the polynucleotides were isolated from cDNA libraries of a cancerous cell line, see Example 1). Genes that are expressed in a cancerous cell have utility as, for example, encoding a therapeutic target. Genes that are differentially expressed between cancerous and normal cells have utility in, for example, diagnostics for detection of a cancerous cell.

In view of the specific utility of the sequences, Applicants respectfully request that the rejection of claims 58, 60-66, 116, and 126 under 35 U.S.C. § 101 be withdrawn. Moreover, since each of the claimed polynucleotides correspond to a gene that is differentially expressed in cancer cells and have a specific utility as, for example, a diagnostic, one skilled in the art would know how to use the claimed differentially expressed sequences as diagnostics.

As such, this rejection of claims 58, 60-66, 116, and 126 under 35 U.S.C. § 112, first paragraph, may be withdrawn.

As noted above, the rejection of claims 40, 42-48, 85, 87-102, 114, 119, 120, 124, 129, and 130 has been rendered moot by the cancellation of these claims.

Rejection under 35 U.S.C. §112, first paragraph

The rejection of claims 22, 24-31, 33-40, 42-49, 51-58, 60-67, 69-76, 68-85, 87-94, 96-103, 105-131 has been maintained for reasons of record in the first Office Action mailed November 29, 2000. In

that Office Action, the Office asserted that that the specification provides insufficient written description to support the genus of nucleic acid sequences encompassed by the claims, which include full length cDNA, sequences that hybridize to SEQ ID NOS: 65, 253, 329, 739, 1186, 1780, 1899, 1938, 1998, and 2007, sequences from other species, mutated sequences, allelic variants, and splice variants. The Office Action further claimed that with the exception of the specific SEQ ID NOS, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides and/or proteins, regardless of the complexity or simplicity of the method of isolation. In making the rejection, the Office cited *Amgen, Inc. v. Chugai Pharmaceutical Co.*, *Fiers v. Revel*, *Fiddes v. Baird*, and *University of California v. Eli Lilly and Co.*

In response to Applicants' arguments filed in response to the above-described rejection, the Office states:

> Applicant's arguments filed 04 June 2001 have been fully considered but they are not persuasive. The applicants state that they have disclosed two species of the claimed genus of polynucleotides, however the asserted two species appear to be identical in that the deposited strains comprise the same sequences as the disclosed SEQ ID NOS. The applicants point to the issuance of U.S. Patent No. 5,861,248 as allegedly conflicting with the above stated rejection. Notwithstanding the issuance of a U.S. Patent No. that might be construed as being in conflict with the above rejection, the Office guidelines for compliance with the written description requirement...will be enforced.

This rejection is traversed as applied and as it may apply to the presently pending claims.

The presently pending claims are directed to polynucleotides, cDNAs, recombinant host cells, vectors, polynucleotide sequences of inserts contained in ATCC deposited clones, methods of making polypeptides, and cDNAs produced by amplification using a fragment of a specific sequence. The polynucleotide sequences that are the basis for these claims are differentially expressed in cancerous cells relative to normal, non-cancerous cells.

The Office has Not Met Its Burden of Establishing a Prima Facie Case of Lack of Written Description

The inquiry for adequacy of written description is whether one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time the application was filed. The courts have held that there is a "strong presumption" that an adequate written description of the claimed invention is present when the application is filed.[1] The Office "has the initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a

[1] *See, e.g., In re Wertheim*, 541 F.2d 257 (CCPA 1976).

description of the invention defined by the claims."[2] With respect to this burden, the Guidelines for Examination of Patent Applications Under the 35 U.S.C. 112, ¶1, "Written Description" Requirement, state:

> A description as filed is **presumed to be adequate, unless or until sufficient evidence or reasoning to the contrary has been presented by the examiner to rebut the presumption.** The examiner, therefore, must have a **reasonable basis** to challenge the adequacy of the written description. The examiner has the **initial burden** of presenting by a **preponderance of evidence** why a person skilled in the art would not recognize in an applicant's disclosure a description of the invention defined by the claims. In rejecting a claim, the examiner must set forth **express findings of fact** regarding the above analysis which support the lack of written description conclusion. These findings should:
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> (1) Identify the claim limitation at issue; and
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> (2) **Establish a prima facie case by providing reasons** why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed. **A general allegation of "unpredictability in the art" is not a sufficient reason to support a rejection for lack of adequate written description.**[3] (emphasis added)

Applicants respectfully submit that the Office's burden has not been met and that the specification provides adequate written description of the claimed invention such that one of skill in the art would recognize that Applicants' had possession of the claimed invention.

The Office has not provided **"sufficient evidence or reasoning to the contrary...to rebut the presumption"** of adequacy of the written description.[4] In fact, the Office has presented no evidence whatsoever as to why a person of skill in the art would not recognized Applicants' possession of the claimed invention. In the first Office Action, mailed November 29, 2000, the Office merely stated that not more than the specific SEQ ID NOS are adequately described and cited the above-mentioned cases in support. None of those cases establish why the skilled artisan would not recognize Applicants' possession. The Office provided no other evidence.

Then, in response to Applicants' arguments, the Office simply replies that "[n]otwithstanding any issuance of a U.S. Patent that might be construed as being in conflict with the above rejection, the Office guidelines for compliance with the written description requirement will be enforced." Again, the Office has failed to meet its burden of establishing that the invention lacks written description. A

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[2] *Id.* at 263.
[3] 66 Fed. Reg. 1107 (January 2001).
[4] *Id.*

reference to "Office guidelines" is not sufficient evidence or reasoning to rebut the presumption that the invention fulfills the written description requirement.

In sum, the Office has failed to establish a *prima facie* case of lack of written description. Applicants' specification presumptively provides an adequate written description and the Office has failed to present adequate grounds to sustain a written description rejection, providing little more than conclusory statements and vague assertions. Applicants' thus submit that the presently pending claims meet the written description requirement and that this rejection of the claims under 35 U.S.C. §112, first paragraph, should be withdrawn.

Nevertheless, solely in the interest of expediting prosecution, Applicants provide the following comments regarding the written description of the presently pending claims. The Office attempts to rely on the following four Federal Circuit and Board of Patent Appeals and Interferences cases in support of its assertion that the invention lacks written description.

Amgen, Inc. v. Chugai Pharmaceutical, Co.

In *Amgen, Inc. v. Chugai Pharmaceutical, Co.*, Amgen sued Genetics Institute and Chugai Pharmaceuticals for patent infringement. The Amgen patent issued on October 27, 1987 and contained claims to the DNA sequence encoding human erythropoietin (EPO). Amgen claimed priority of invention based on isolation of EPO clones in 1983.[5]

Prior to Amgen's cloning of the EPO gene, however, Genetics Institute had isolated and purified the EPO protein and had also disclosed a possible method of purifying and isolating the EPO DNA sequence.[6] The USPTO issued a patent to Genetics Institute on June 30, 1987 containing claims to the EPO protein itself.[7] Genetics Institute did not actually clone the EPO cDNA until August 1984, and began making recombinant EPO using the cDNA shortly thereafter.[8]

The Federal Circuit held that the Amgen patent was not invalidated based on the earlier disclosure by Genetics Institute of a probing strategy to screen a DNA library for the EPO coding sequence, even though this strategy eventually resulted in the actual cloning of the gene by Genetics Institute.[9] Genetics Institute's disclosure of the protein, and a method for isolating and purifying the

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[5] 927 F.2d 1200 (Fed. Cir. 1991).
[6] *Id.* at 1205.
[7] *Id.* at 1203.
[8] *Id.* at 1205-06.
[9] *Id.* at 1206.

EPO DNA sequence, was insufficient to constitute actual conception of the DNA encoding EPO.[10] Applying chemical case law precedent,[11] the Amgen court stated:

> A gene is a chemical compound, albeit a complex one, and it is well established in our law that conception of a chemical compound requires that the inventor be able to **define it so as to distinguish it from other materials**, and to describe how to obtain it. Conception does not occur unless one has a mental picture of the **structure of the chemical**, or is able to **define it by its method of preparation**, its physical or chemical properties, or **whatever characteristics sufficiently distinguish it**. It is not sufficient to define it solely by its principle biological property, *e.g.*, encoding human erythropoietin, because an alleged conception having no more specificity than that is simply a wish to know the identity of any material with that biological property.[12] (emphasis added)

Thus, since Genetics Institute had not yet cloned the DNA sequence encoding EPO when it filed its patent application, and the specification only suggested a possible method by which to isolate the DNA sequence, Genetics Institute could not have a mental conception of the EPO DNA sequence at the time the application was filed.[13] The court did not invoke the requirement that the actual DNA sequence be disclosed, but only that the DNA be defined in a way to distinguish it from other chemicals along with a description of how to obtain it.[14]

Fiers v. Revel

In 1993, the Federal Circuit applied the holding in *Amgen* to an interference case where three parties (Fiers, Revel, and Sugano) claimed patent rights to the DNA encoding human fibroblast beta interferon (IFN-β). In *Fiers v. Revel*,[15] Fiers asserted priority based on his conception of a method for isolating the IFN-β DNA in 1979 or early 1980, coupled with due diligence towards a constructive reduction to practice on April 3, 1980.[16] Before he isolated the DNA, Fiers had disclosed his method to two American scientists, both of whom submitted affidavits that Fiers' method would have allowed a person of ordinary skill in the art to isolate the IFN-β DNA sequence without undue experimentation.[17]

Fiers asserted that the stringent written description requirement set forth in *Amgen* only applied when the disclosed method for isolating a DNA sequence could not easily be carried out by one of

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[10] *Id.*
[11] See *Oka v. Youssefyeh*, 849 F.2d 581, 583 (Fed. Cir. 1988). The court, in Amgen, classified DNA as a complex chemical compound and held that "it is well established in our law that conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials, and ... describe how to obtain it." *Amgen*, 927 F.2d at 1206.
[12] *Amgen*, 927 F.2d at 1206 (citations omitted).
[13] *Id.*
[14] *Id.*
[15] 984 F.2d 1164, 1166 (Fed. Cir. 1993).
[16] *Id.*

ordinary skill in the art.[18] Fiers also argued that *Amgen* allows conception of a DNA sequence by its method of isolation.[19] The Federal Circuit rejected both of these arguments, stating that Fiers was focusing inappropriately on the issue of enablement rather than written description.[20] The court also stated that, before reduction to practice, conception only of a process for making a substance, without a **conception of a structural or equivalent definition** of that substance, cannot constitute more than conception of the substance claimed as a process (product-by-process claim).[21] **Conception of a substance claimed *per se*, without reference to a process requires conception of its structure, name, formula, or definitive chemical or physical properties.**[22]

Revel sought to use the benefit of a 1979 Israeli application as a constructive reduction to practice to prove priority of invention for IFN-β DNA. The court held that the Israeli application did not contain an adequate written description of a DNA encoding IFN-β because it only disclosed a method for isolating a fragment of the DNA coding for IFN-β and a method for isolating IFN-β mRNA.[23] The court concluded:

> An adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself....Revel's application does not even demonstrate that the disclosed method actually leads to the DNA, and thus that he had possession of the invention, since it only discloses a clone that might be used to obtain mRNA coding for [IFN-β]. A bare reference to a DNA with a statement that it can be obtained by reverse transcription is not a description; it does not indicate that Revel was in possession of the DNA.[24]

The court went on to note that the reasoning applied in *Amgen*, with respect to what is necessary to show conception, also applies to the adequacy of descriptions of DNA:

> As we stated in Amgen ... such a disclosure just represents a wish, or arguably a plan, for obtaining the DNA. If a conception of a DNA requires a **precise definition, such as by structure, formula**, chemical name, or physical properties, ... then a description also requires that degree of specificity.... [O]ne cannot describe what one has not conceived. [25]

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[17] *Id.*
[18] *Id.* at 1169.
[19] *Id.*
[20] *Id.*
[21] *Id.*
[22] *Id.*
[23] *Id.* at 1167.
[24] *Id.* at 1170-71.
[25] *Id.* at 1171.

Thus, it appears from the *Fiers* decision that there must be some specific characterization of the DNA itself to convey to one skilled in the art that the inventor was in possession of the DNA at the time of filing. The court ultimately held that Sugano, another party in the action, was entitled to priority because the disclosure in his 1980 application contained the DNA which codes for IFN-β, along with a detailed disclosure of the method used to obtain that DNA.[26]

Fiddes v. Baird

The Office also relies on the 1993 decision in *Fiddes v. Baird*,[27] in which the Board of Patent Appeals and Interferences cited *Fiers* in a priority contest over inventorship of recombinant DNA molecules encoding fibroblast growth factors ("FGFs"). Baird claimed priority on the basis of an application that set forth the amino acid sequence for bovine pituitary FGF and a *theoretical* DNA sequence encoding that protein, along with a method for obtaining a cDNA corresponding to the protein. The application did not teach the actual naturally-occurring DNA sequence encoding the FGF protein.[28] Since the nucleotide sequence of the naturally-occurring DNA molecule was not sufficiently disclosed, the Board followed *Fiers* in determining that Baird was not in possession of the broad class of naturally-occurring genes encoding mammalian FGFs:

> An adequate description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; **what is required is a description of the DNA itself.**
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> * * *
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> If a conception of a DNA requires a **specific definition, such as by structure, formula**, chemical name, or physical properties, as we have held, then a description also requires that degree of specificity....[O]ne cannot describe what one has not conceived.[29] (emphasis added)

The Board further stated that "knowledge of the amino acid sequence of a protein coupled with the established relationship in the genetic code between a nucleic acid and the protein it encodes would not establish possession of the gene encoding that protein."[30]

Regents of the University of California v. Eli Lilly & Co.

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[26] *Id.*
[27] 30 USPQ2d 1398 (BPAI 1993).
[28] *Id.* at 1482-81.
[29] *Id.* at 1482-83, *citing Fiers*, 984 F.2d at 1170-71.
[30] *Id.*

The most recent case cited by the Office to support its assertion that the invention fails to meet the written description requirement is *Regents of the University of California v. Eli Lilly & Co.*[31] In 1977, the University of California (UC) cloned the rat insulin gene and filed a patent application that same year claiming the rat and human insulin genes, as well as broadly claiming all mammalian and vertebrate insulin genes.[32] After a patent issued to UC on the insulin gene in March 24, 1987 (U.S. Patent No. 4,652,525), UC filed suit against Eli Lilly for patent infringement for its sale of synthetic human insulin.[33] Claims 2, 4, and 5 of the '525 patent were as follows:

> 2. A recombinant procaryotic microorganism modified to contain a nucleotide sequence having the structure of the reverse transcript of an mRNA of a vertebrate, which mRNA encodes insulin.
> 4. A microorganism according to claim 2 wherein the vertebrate is a mammal.
> 5. A microorganism according to claim 2 wherein the vertebrate is a human.

UC thus claimed all vertebrate, mammalian, and human insulin cDNA sequences.

The Federal Circuit, relying on its reasoning in *Fiers*, held that the broad claims of the '525 patent were invalid for lack of a written description.[34] The court reasoned that a description of rat insulin cDNA is not a description of vertebrate, mammalian, or human cDNA.[35] Likewise, the court reasoned that the mere name "mammalian insulin cDNA" in a claim is not an adequate description because it describes the function of the gene, but not its structure.[36] The court went on:

> In claims involving chemical materials, generic formulae usually indicate with specificity what the generic claims encompass. **One skilled in the art can distinguish such a formula from others and can identify many of the species that the claims encompass.** Accordingly, **such a formula is normally an adequate description** of the claimed genus. In claims to genetic material, however, a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus....
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> Thus, as we have previously held, a cDNA is not defined or described by the mere name "cDNA," even if accompanied by the name of the protein that it encodes, but requires a kind of specificity usually achieved by means of the recitation of the sequence

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[31] 119 F.3d 1559 (Fed. Cir. 1997).
[32] *Id.* at 1562-63.
[33] *Id.* at 1562.
[34] *Id.* at 1566-69.
[35] *Id.* at 1568.
[36] *Id.* at 1568.

> of nucleotides that make up the cDNA. A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or **of a recitation of structural features common to the members of the genus**, which features constitute a substantial portion of the genus...We will not speculate in what other ways a broad genus of genetic material may be properly described, but it is clear to us...that the genera of vertebrate and mammal cDNA are not described by the general language of the '525 patent's written description supported only by the specific nucleotide sequence of rat insulin.[37] (emphasis added)

Thus, while the '525 patent specification contained adequate written description of the rat insulin cDNA, this description did not give UC a right to also claim the cDNA encoding all vertebrate or mammalian insulin. Describing one member of the genus, without reciting structural features common to the members of the genus, does not give the inventor a right to claim the entire genus, only that one member. The '525 patent provided no sequence information for the claimed human insulin cDNA. Simply providing a general method of producing human insulin cDNA and a description of the human insulin amino acid sequence that cDNA encodes, does not provide a written description of human insulin cDNA.[38]

The Facts of the Cited Cases are Distinct from those of the Instant Application

None of the four cases discussed above provide a situation analogous to the one at hand. In all four cases, a party was attempting to broadly claim a DNA sequence based on the amino acid sequence of the encoded protein or on the DNA sequence encoding the protein from a different animal. In no case had the party provided a sequence that was present in all members of the claimed genus of sequences or a structural characteristic common to all members of the claimed genus. As such, the party could not describe the sequence "so as to distinguish it from other materials" as required by the courts. None of the four cases are analogous to the instant application.

As stated in *Amgen*, DNA is simply a chemical compound that can be conceived of by a mental picture of the structure of the compound or whatever characteristics sufficiently distinguish it. In *Lilly*, the court stated that in claims involving chemical materials, generic formulae must indicate with specificity what the claims encompass such that one skilled in the art can **distinguish the formula from other formulas and can identify many of the species the claims encompass**. Such a formula generally constitutes an adequate written description of the claimed genus. *Lilly* also held that a

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[37] *Id.*at 1568-69.
[38] *Id.* at 1567.

[redacted]

description of a genus of cDNAs may be achieved by recitation of structural features common to the members of the genus. Moreover, the court in *Fiers* held that conception of a substance requires conception of its structure, formula, or definitive chemical or physical properties.

The Applicants of the Instant Application have Provided Nucleotide Sequences that Define the Claimed Polynucleotides

In the instant application, Applicants have provided specific nucleotide sequences that represent a distinguishing structural feature common to the genus of claimed polynucleotides. The provided sequences are the structural features that are common to the members of the claimed genus and serve to define the claimed genus. For example, claim 22 is directed to an isolated polynucleotide comprising at least 35 contiguous nucleotides of a nucleotide sequence selected from the group consisting of SEQ ID NO: 65, a degenerate variant of SEQ ID NO: 65, and a complement of SEQ ID NO: 65. With the knowledge of the nucleotide sequence of SEQ ID NO: 65, one skilled in the art can easily determine if a sequence is a member of the claimed genus.

This sequence recited in the claims provides the claimed invention with a critical defining feature – one that was said to be lacking in the claims considered and rejected in each of *Amgen, Fiers, Lilly,* and *Fiddes*. The sequence recited in the claims defines the claimed polynucleotide "so as to distinguish it from other materials."[39] The recited sequence also provides "a structural or equivalent definition" of the claimed polynucleotide.[40] Moreover, the sequence recited in the claims provides "a recitation of structural features common to the members of the [claimed] genus."[41] Thus, it is much more than a mere wish to obtain a composition – it defines the composition.

The polynucleotides of the invention are also claimed in product-by-process claims, which are directed to an isolated cDNA obtained by the process of amplification using a polynucleotide comprising at least a specific number of nucleotides of a nucleotide sequence of a specific SEQ ID NO. Product-by-process claims are a well-accepted alternative way for applicants to claim their inventions.[42] These claims are in keeping with the law as expressed by the court in *Amgen*, which stated that a DNA sequence can be defined by its method of preparation.

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[39] *Amgen*, 927 F.2d at 1206.
[40] *Fiers*, 984 F.2d at 1169. *See also Fiddes*, 30 USPQ2d at 1482-83.
[41] *Lilly*, 119 F.3d at 1568-69.
[42] *See, e.g., In re Hughes,* 496 F.2d 1216 (CCPA 1974); *In re Bridgeford,* 357 F.2d 697 (CCPA 1966); Chisum §8.05.

[redacted]

With regard to product-by-process claims, the Office asserts that "merely claiming a composition in a product by process format does not relieve the applicants from the duty of providing adequate written description of the claimed product." As explained above, however, the Applicants have provided a sequence, which sequence serves to define the claimed invention. Thus, one skilled in the art can envision the sequences that would be obtained by a process of amplification using a polynucleotide for which the sequence has been provided.

The application also contains claims to inserts of ATCC-deposited clones. These clone inserts are fully described in the application, and they comprise a sequence of a SEQ ID NO described in the application. Accordingly, one of skill in the art would reasonably conclude that Applicants had possession of the claimed invention at the time the application was filed.

The Office has not Met It's Burden of Establishing that One Skilled in the Art would not Recognize that Applicants' had Possession of the Claimed Invention

As stated above, the Office has provided no evidence as to why one of skill in the art would not recognize Applicants' possession of the claimed invention. In the original rejection, the Office simply cited the above four cases, each of which are based upon factual scenarios inapplicable to that of the instant application. In response to Applicants' counter arguments, the Office cites PTO guidelines in upholding the rejection, again providing no actual evidence to support the assertion of lack of written description. Applicants fail to see how "office policy" affects the scope of a patent grantable under current case law. The courts' interpretation of 35 U.S.C. §112, first paragraph, is what determines appropriate claim scope, not "office policy." According to the above analysis of the cited cases, the pending claims fulfill the written description requirement.

Applicants also previously drew the Office's attention to U.S. Patent No. 5,861,248, which was filed on March 29, 1996, and issued on January 19, 1999. This patent discloses and broadly claims ESTs for genes that are differentially expressed in human prostate cancers as compared to normal prostate cells. As noted previously, the court decisions cited by the Office in support of the rejection were all decided prior to the granting of the '248 patent. Thus, the claims of the '248 patent were all granted by the Office in light of the same case law to which the present application is subject. While Applicants recognize that adequacy of written description is assessed on a case-by-case basis, Applicants invite the Office to explain why the written description of the '248 patent was sufficient, while that of the instant invention has been deemed insufficient, when there is no real difference between the claims or disclosure of the two inventions. Surely, a change in "office policy," under the

same case law, would not account for such a difference since it is up to the courts, not the PTO, to determine the scope of the written description requirement.

Conclusion

The claims of the instant application are supported by an adequate written description. The Office has provided no evidence, in either the original rejection or the rebuttal of Applicants' response, to establish that one of skill in the art would not recognize that Applicants had possession of the claimed invention at the time the application was filed. The four cases cited in support of the Office's assertions in the original rejection did not address a situation similar to the one at hand, where common structural features have been provided for all members of the claimed genera.

As stated above, the claimed genera of polynucleotides are defined by common structural characteristics such that one skilled in the art can easily determine whether a sequence falls within a claimed genera, can envision a multitude of sequences having that structural characteristic common to a claimed genera, and would thus recognize that Applicants had possession of the claimed genera at the time of filing. Moreover, as noted above, the Office has failed to provide the "sufficient evidence or reasoning" necessary to support a written description rejection. Conclusory statements can not, standing alone, constitute a *prima facie* case of lack of written description. Accordingly, Applicants respectfully request withdrawal of this rejection of the claims under 35 U.S.C. §112, first paragraph.

Rejections under 35 U.S.C. §102(a)

Rejection under 35 U.S.C §102(a): GenBank Accession Number AA444267

Claims 22, 24, and 112 have been rejected under 35 U.S.C. §102(a) as being anticipated by GenBank Accession Number AA444267. In response to Applicants' arguments filed May 29, 2001, the Office states:

> Applicant's arguments filed 04 June 2001 have been fully considered but they are not deemed persuasive. The applicants have amended the claims to recite longer regions of contiguous nucleotides than that indicated on the lineup comparisons to the cited prior art attached to the Office action mailed 29 November 2000. However the claims recite the phrase "a degenerate variant of" the recited SEQ ID NO and the claim has thus been interpreted broadly to continue to read on the cited prior art sequences.

This rejection is traversed as applied and as it may apply to the presently pending claims.

The Office has broadly interpreted the term "degenerate variant" to mean "any sequence variant." The Office's broad interpretation of "degenerate variant" is not that which is understood by

[redacted]

the skilled artisan. Applicants submit that one skilled in the art understands that "degenerate variant" refers to a polynucleotide sequence which encodes the same polypeptide as a given polynucleotide sequence, but differs in coding sequence due to the degeneracy of the genetic code. The genetic code is "degenerate" in that two or more different codons can encode the same amino acid. For example, the codons "cuu", "cuc", "cua", and "cug" all code for the amino acid leucine. Thus, two different polynucleotide sequences that differ from each other by at least one nucleotide, but that both encode the same polypeptide are said to be degenerate variants of each other.

Applicants have provided as Exhibit 2 the results of a BLAST comparison of the nucleotide sequence of SEQ ID NO: 65 with the nucleotide sequence of GenBank Accession Number AA444267, in which the nucleotide sequences are translated in all six reading frames. Thus, the results show the degree of similarity between all of the polypeptides possibly encoded by the nucleotide sequences. As this translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 11 amino acids. Thus, the longest region in which the polynucleotide of SEQ ID NO: 65 and the polynucleotide of GenBank Accession Number AA444267 are degenerate variants of each other is 33 nucleotides, while the claimed polynucleotide comprises at least 35 contiguous nucleotides of a degenerate variant of SEQ ID NO: 65.

Accordingly, Applicants respectfully request that this rejection of claims 22, 24, and 112 under 35 U.S.C. §102(a) be withdrawn.

Rejection under 35 U.S.C §102(a): GenBank Accession Numbers W94391, H43467, W66607, AA114761, HSU36478, HSU14990, HSRNAP14K, RRU48288, and U01137

Sets of claims (grouped according to independent claims and claims dependent thereon) 31, 33, and 113; 40, 42, and 114; 49, 51, and 115; 58, 60, and 116; 67, 69, and 117; 76, 78, and 118; 85, 87, and 119; 94, 96, and 120; and 103, 105, and 121 have been rejected under 35 U.S.C. §102(b) as being anticipated by GenBank Accession Numbers W94391, H43467, W66607, AA114761, HSU36478, HSU14990, HSRNAP14K, RRU48288, and U01137, respectively. This rejection is traversed as applied and as it may apply to the presently pending claims.

As noted above, in making this rejection the Office has broadly interpreted the phrase "degenerate variant" to mean "any sequence variant." However, one skilled in the art understands that "degenerate variant" refers to a polynucleotide sequence which encodes the same polypeptide as a given polynucleotide sequence, but differs in coding sequence due to the degeneracy of the genetic code.

Thus, two different polynucleotide sequences that differ from each other by at least one nucleotide, but that both encode the same polypeptide are said to be degenerate variants of each other.

Applicants have provided as Exhibits 3-8, the results of a BLAST comparison of the nucleotide sequence of SEQ ID NOS: 253, 739, 1186, 1780, 1899, 2007 with the nucleotide sequence of GenBank Accession Numbers W94391, W66607, AA114761, HSU36478, HSU14990, and U01137, respectively, in which each nucleotide sequence is translated in all six reading frames. The rejection as to sets of claims 40, 42, and 114; 85, 87, and 119; and 94, 96, and 120 is rendered moot by the cancellation of these claims.

With regard to claims 31, 33, and 113, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 16 amino acids (Exhibit 3). Thus, the longest region in which the polynucleotide of SEQ ID NO: 253 and the polynucleotide of GenBank Accession Number W94391 are degenerate variants of each other is 48 nucleotides, while the claimed polynucleotide comprises at least 50 contiguous nucleotides of a degenerate variant of SEQ ID NO: 253.

With regard to claims 49, 51, and 115, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 21 amino acids (Exhibit 4). Thus, the longest region in which the polynucleotide of SEQ ID NO: 739 and the polynucleotide of GenBank Accession Number W66607 are degenerate variants of each other is 63 nucleotides, while the claimed polynucleotide comprises at least 100 contiguous nucleotides of a degenerate variant of SEQ ID NO: 739.

With regard to claims 58, 60, and 116, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 91 amino acids (Exhibit 5). Thus, the longest region in which the polynucleotide of SEQ ID NO: 1186 and the polynucleotide of GenBank Accession Number AA114761 are degenerate variants of each other is 273 nucleotides, while the claimed polynucleotide comprises a degenerate variant of SEQ ID NO: 1186, the sequence of which is 300 nucleotides in length.

With regard to claims 67, 69, and 117, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 8 amino acids (Exhibit 6). Thus, the longest region in which the polynucleotide of SEQ ID NO: 1780 and the polynucleotide of GenBank Accession Number HSU36478 are degenerate variants of each other is 24 nucleotides, while the claimed polynucleotide comprises at least 35 contiguous nucleotides of a degenerate variant of SEQ ID NO: 1780.

With regard to claims 76, 78, and 118, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 23 amino acids (Exhibit 7). Thus, the longest region in which the polynucleotide of SEQ ID NO: 1899 and the polynucleotide of GenBank Accession Number HSU14990 are degenerate variants of each other is 69 nucleotides, while the claimed polynucleotide comprises at least 100 contiguous nucleotides of a degenerate variant of SEQ ID NO: 1899.

With regard to claims 103, 105, and 121, as the translated BLAST comparison demonstrates, the longest sequence of amino acid identity between the encoded polypeptides is 31 amino acids (Exhibit 8). Thus, the longest region in which the polynucleotide of SEQ ID NO: 2007 and the polynucleotide of GenBank Accession Number U01137 are degenerate variants of each other is 93 nucleotides, while the claimed polynucleotide comprises at least 100 contiguous nucleotides of a degenerate variant of SEQ ID NO: 2007.

Accordingly, Applicants respectfully request that this rejection of the claims under 35 U.S.C. §102(a) be withdrawn.

Rejection under 35 U.S.C. §103(a)

Sets of claims 26-29, 35-38, 44-47, 53-56, 62-65, 71-74, 80-83, 89-92, 98-101, and 107-110 have been rejected under 35 U.S.C. §103(a) as being unpatentable over GenBank Accession Numbers AA444267, W94391, H43467, W66607, AA114761, HSU36478, HSU14990, HSRNAP14K, RRU48288, and U01137, each in view of Yang et al. for reasons of record in the Office Action mailed 29 November 2000. This rejection is traversed as applied and as it may apply to the presently pending claims.

Applicants first note that claims 44-47, 89-92, and 98-101 have been canceled. The remaining rejected claims are dependent on, or utilize, the polynucleotide of claims 22, 31, 49, 58, 67, 76, and 105, respectively. As demonstrated above, these claims have been amended such that the claimed sequences are novel over the sequences of the corresponding GenBank Accession Numbers. Yang et al. describes a two-hybrid assay to detect protein-peptide interactions. The method of Yang et al. involves incorporating nucleotides into plasmids, generating libraries using *E. coli* cells, and expressing the encoded peptides. However, one of skill in the art could not have performed these steps with the claimed polynucleotides because the claimed polynucleotides were unknown before being described by Applicants in the present application.

Thus, the rejected claims are not obvious over the cited GenBank Accession Numbers in view of Yang et al. and this rejection under 35 U.S.C. §103(a) may be withdrawn.

Conclusion

Applicant submits that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815, order number 23001481.

Respectfully submitted,
BOZICEVIC, FIELD & FRANCIS LLP

Date: April 1, 2002

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Enclosures:

- Exhibits 1-8
- Replacement pages 131, 132, 634-637, and 639-652

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Claims 40, 42-48, 85, 87-93, 94, 96-102, 114, 119, 120, 124, 129, and 130 have been canceled.

Claims 49, 51, 58, 60, 67, 69, 103, 105, 125, 126, 127, and 131 have been amended as follows.

49. (Twice Amended) An isolated polynucleotide comprising at least [35] 100 contiguous nucleotides of a nucleotide sequence selected from the group consisting of: SEQ ID NO:739, a degenerate variant of SEQ ID NO:739, and a complement of SEQ ID NO:739.

51. (Twice Amended) An isolated antisense nucleic acid molecule comprising at least [35] 100 contiguous nucleotides of the polynucleotide of claim 49.

58. (Twice Amended) An isolated polynucleotide comprising [at least 100 contiguous nucleotides of] a nucleotide sequence selected from the group consisting of: SEQ ID NO:1186, a degenerate variant of SEQ ID NO:1186, and a complement of SEQ ID NO:1186.

60. (Twice Amended) An isolated antisense nucleic acid molecule comprising [at least 100 contiguous nucleotides of] the polynucleotide of claim 58.

67. (Twice Amended) An isolated polynucleotide comprising at least [20] 35 contiguous nucleotides of a nucleotide sequence selected from the group consisting of: SEQ ID NO:1780, a degenerate variant of SEQ ID NO:1780, and a complement of SEQ ID NO:1780.

69. (Twice Amended) An isolated antisense nucleic acid molecule comprising at least [20] 35 contiguous nucleotides of the polynucleotide of claim 67.

103. (Twice Amended) An isolated polynucleotide comprising at least [50] 100 contiguous nucleotides of a nucleotide sequence selected from the group consisting of: SEQ ID NO:2007, a degenerate variant of SEQ ID NO:2007, and a complement of SEQ ID NO:2007.

105. (Twice Amended) An isolated antisense nucleic acid molecule comprising at least [50] 100 contiguous nucleotides of the polynucleotide of claim 103.

125. (Amended) An isolated cDNA obtained by the process of amplification using a polynucleotide comprising at least [35] 100 contiguous nucleotides of a nucleotide sequence of SEQ ID NO:739.

126. (Amended) An isolated cDNA obtained by the process of amplification using a polynucleotide comprising at least [100] 200 contiguous nucleotides of a nucleotide sequence of SEQ ID NO: 1186.

127. (Amended) An isolated cDNA obtained by the process of amplification using a polynucleotide comprising at least [20] 35 contiguous nucleotides of a nucleotide sequence of SEQ ID NO: 1780.

131. (Amended) An isolated cDNA obtained by the process of amplification using a polynucleotide comprising at least [50] 100 contiguous nucleotides of a nucleotide sequence of SEQ ID NO: 2007.

New claims 132-145 have been added.

Replacement Pages Per Response to

Final Office Action of October 2, 2001

All publications and patent applications cited in this specification are herein incorporated by reference as if each individual publication or patent application were specifically and individually indicated to be incorporated by reference. The citation of any publication is for its disclosure prior to the filing date and should not be construed as an admission that the present invention is not entitled to antedate such publication by virtue of prior invention.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is readily apparent to those of ordinary skill in the art in light of the teachings of this invention that certain changes and modifications may be made thereto without departing from the spirit or scope of the appended claims.

Deposit Information:

The following materials were deposited with the American Type Culture Collection: CMCC = (Chiron Master Culture Collection)

Cell Lines Deposited with ATCC

Cell Line	**Deposit Date**	**ATCC Accession No.**	**CMCC Accession No.**
KM12L4-A	March 19, 1998	CRL-12496	11606
Km12C	May 15, 1998	CRL-12533	11611
MDA-MB-231	May 15, 1998	CRL-12532	10583
MCF-7	October 9, 1998	CRL-12584	10377

cDNA Libraries Deposited with ATCC

cDNA Library No. Deposit Date ATCC Accession No.	cDNA Library ES21 January 22, 1999 ATCC No.	cDNA Library ES22 January 22, 1999 ATCC No.	cDNA Library ES23 January 22, 1999 ATCC No.
Clone Names	M00001575D:G05	M00001364A:E11	M00001489B:A06
	M00001460A:A03	M00001694C:H10	M00001585A:D06
	M00001655C:E04	M00003841D:E03	M00001637B:E07
	M00001676C:C11	M00004176D:B12	M00001529D:H02
	M00001679D:D05	M00001387B:E02	M00001500C:C08
	M00001546B:C05	M00004282B:A04	M00001483B:D03
	M00001453B:E10	M00001376B:F03	M00001623C:H07
		M00001445D:A06	M00003975B:F03
		M00001399C:H12	
		M00004208D:H08	

cDNA Library No.	cDNA Library ES24	cDNA Library ES25	cDNA Library ES26
Deposit Date	January 22, 1999	January 22, 1999	January 22, 1999
ATCC Accession No.	ATCC No.	ATCC No.	ATCC No.
Clone Names	M00003987D:D06	M00001675D:B08	M00001479C:F10
	M00004073A:H12	M00001589B:E12	M00003842D:F08
	M00004104B:F11	M00001607D:A11	M00003901A:C09
	M00004237D:D08	M00001636A:E07	M00003982A:B06
	M00004111D:B07	M00001530A:B12	M00003824A:A06
	M00004138B:B11	M00001495B:B08	M00003845D:C03
	M00001391C:C04	M00001487C:F01	M00003856A:B07
	M00001448D:E12	M00001644B:D06	M00004104B:A02
	M00001450A:B03	M00003751C:A04	M00004110C:E03
	M00001451B:F01		

In addition, libraries of selected clones were deposited. The details of these deposits are provided in Tables 21-24.

This deposit is provided merely as convenience to those of skill in the art, and is not an admission that a deposit is required under 35 U.S.C. §112. The sequence of the polynucleotides contained within the deposited material, as well as the amino acid sequence of the polypeptides encoded thereby, are incorporated herein by reference and are controlling in the event of any conflict with the written description of sequences herein. A license may be required to make, use, or sell the deposited material, and no such license is granted hereby.

Retrieval of Individual Clones from Deposit of Pooled Clones

Where the ATCC deposit is composed of a pool of cDNA clones, the deposit was prepared by first transfecting each of the clones into separate bacterial cells. The clones were then deposited as a pool of equal mixtures in the composite deposit. Particular clones can be obtained from the composite deposit using methods well known in the art. For example, a bacterial cell containing a particular clone can be identified by isolating single colonies, and identifying colonies containing the specific clone through standard colony hybridization techniques, using an oligonucleotide probe or probes designed to specifically hybridize to a sequence of the clone insert (*e.g.*, a probe based upon unmasked sequence of the encoded polynucleotide having the indicated SEQ ID NO). The probe should be designed to have a T_m of approximately 80°C (assuming 2°C for each A or T and 4°C for each G or C). Positive colonies can then be picked, grown in culture, and the recombinant clone isolated. Alternatively, probes designed in this manner can be used to PCR to isolate a nucleic acid molecule from the pooled clones according to methods well known in the art,

Table 21. Clones Dep sited on January 22, 1999

cDNA LIbrary Ref. ATCC No	Library ES17 207064	Library ES18 207065	Library ES19 207066
Clone Names	M00001601A:E09	M00001594A:D06	M00003906A:F04
	M00001368A:D07	M00001613D:H10	M00003908A:F12
	M00003917A:D02	M00001596D:E10	M00003914A:G09
	M00001673A:A04	M00001592C:G04	M00003915C:H04
	M00003868B:G11	M00001599D:A09	M00003905D:B08
	M00003917C:D03	M00001619B:A09	M00003908C:G09
	M00003791C:E09	M00001593B:E11	M00003914B:A11
	M00003870A:C05	M00001605A:E06	M00003916C:C05
	M00003922A:D02	M00001608A:D03	M00003959A:A03
	M00003861C:H02	M00001616C:A02	M00003905D:C08
	M00003931B:A11	M00001617A:D06	M00003908D:D12
	M00001679D:B05	M00001595C:E01	M00003901B:H04
	M00001679C:D05	M00001616C:A11	M00004031A:E01
	M00001687A:G01	M00001608C:E11	M00004029C:C12
	M00003945A:E09	M00001610C:E06	M00003911A:F10
	M00003908A:H09	M00001612B:D11	M00003914C:F09
	M00001649B:G12	M00001618B:E05	M00003963D:B05
	M00003813D:H12	M00001621C:C10	M00003986C:E09
	M00004087C:D03	M00001647A:H08	M00004031A:F07
	M00004269B:C08	M00001631D:B10	M00003907C:C02
	M00004348A:A02	M00001608D:E09	M00003911B:F08
	M00001679C:D01	M00001641B:C10	M00003914C:H05
	M00001490A:E11	M00001641D:E02	M00003918C:C12
	M00001387A:E10	M00001630D:H10	M00003914C:C02
	M00001397B:G03	M00001585C:D10	M00003914A:E04
	M00001441D:E04	M00001560A:H10	M00003903B:D03
	M00001352C:G09	M00001573B:C06	M00003905A:F09
	M00001370D:A12	M00001660C:D11	M00003867C:E11
	M00001387B:A06	M00001641C:C05	M00003870B:B08
	M00001397C:A10	M00001578B:B05	M00003879D:A08
	M00001536D:G02	M00001587C:C10	M00003891D:B10
	M00003895C:A10	M00001590B:C07	M00003901C:A08
	M00001464B:B03	M00001554A:E04	M00003903C:C04
	M00004370A:G05	M00001570C:G06	M00003905A:F10
	M00001490B:H11	M00001576A:B09	M00003906C:D06
	M00001530B:D10	M00001582A:H01	M00003907D:A12
	M00001579C:E09	M00001582B:E12	M00003905C:G11
	M00001587A:H03	M00001615B:F07	M00003914D:D10
	M00001457C:H12	M00001571C:A04	M00003972A:G09
	M00001535C:E01	M00001573D:D10	M00003975D:C06
	M00001561D:C05	M00001576A:F11	M00003905C:B02
	M00001589A:C01	M00001579C:G05	M00003907D:F11
	M00001664D:G07	M00001582D:A02	M00003914A:G06
	M00001565A:H09	M00001589B:E07	M00003914D:E03
	M00001381C:B08	M00001575B:B02	M00003972C:F08
	M00001395C:F11	M00001578C:G06	M00003976C:D06
	M00001429D:F11	M00001591A:B08	M00003907C:C04

M00001449A:F01	M00001607A:F11	M00003905B:C06
M00001391C:H02	M00001579C:E06	M00004088C:A12
M00001429D:H12	M00001661C:F11	M00004103C:D04
M00001450A:G11	M00001650B:C10	M00004107A:D01
M00001344B:F12	M00001654C:E04	M00004110A:E04
M00001391D:C06	M00001656B:A08	M00004062A:H06
M00003971A:A06	M00001662C:B02	M00004075D:C10
M00001346A:E04	M00001656B:D05	M00004081D:H09
M00001455C:G07	M00001661C:F10	M00004089A:B08
M00001402D:F02	M00001663A:C11	M00004103D:F10
M00001438D:C06	M00001669A:C10	M00004107B:B04
M00001349B:G05	M00001651B:B12	M00004032C:B02
M00001389C:A08	M00001653B:E06	M00004078C:F04
M00001439B:A10	M00001659C:F02	M00004038B:H10
M00001455B:A09	M00001661B:F03	M00004089A:E02
M00001441B:D11	M00001663C:F10	M00004096B:F05
M00001453A:B01	M00001669A:G12	M00004104C:H12
M00001456D:E08	M00001674D:C10	M00004110D:A10
M00001399A:C03	M00001651B:E06	M00004036D:F02
M00004496C:H03	M00001651C:C05	M00004088C:E04
M00004135D:G02	M00001657C:C07	M00004104D:A04
M00004692A:E07	M00001662A:C12	M00004107D:E12
M00004374D:E10	M00001663D:C06	M00004115D:D08
M00004405D:C04	M00001590B:C05	M00003846A:D03
M00004312B:H07	M00001483C:G06	M00004072C:F08
M00003976C:A10	M00001653A:G07	M00004039B:G08
M00004043A:D02	M00001625B:C10	M00003986D:D02
M00004081C:H06	M00001626C:D12	M00003914A:B07
M00004050D:A06	M00001634D:D02	M00003914D:B02
M00001361B:C07	M00001641C:C06	M00003971B:B07
M00004341B:G03	M00001642D:F02	M00003978C:A03
M00001342B:E01	M00001647B:E04	M00003983B:C08
M00004064D:A11	M00001632B:E05	M00004033D:D07
M00004087A:G08	M00001639A:C11	M00004072D:H12
M00004344B:H04	M00001642D:G10	M00004077B:H11
M00004497A:H03	M00001624A:G11	M00004080A:F01
M00001338C:E10	M00001626C:G08	M00004092C:B03
M00001366D:E12	M00001672D:D04	M00004037B:C04
M00001390D:E03	M00001639A:H06	M00004073C:D04
M00001413B:H09	M00001662C:A04	M00004081A:A08
M00004271B:B06	M00001641B:B01	M00004085B:B05
M00004151D:E03	M00001673C:A02	M00004090C:C07
M00001660B:C04	M00001650A:A12	M00004086D:B09
M00003802D:B11	M00001659D:D03	M00004088D:B03
M00001579C:E08	M00001661B:B05	M00004090C:C10
M00001557D:C08	M00001671D:E10	M00004102C:D09
M00003779B:E12	M00001652D:A06	M00004105C:E09
M00001638A:D10	M00001654C:D05	M00004035A:G10
M00003794A:B03	M00001656A:B07	M00003906A:H07
M00001616C:F07	M00001647B:C09	M00004083B:G03

M00001679A:F01	M00001635A:C06	M00001675B:E02
M00001604C:E09	M00001482D:A04	M00003793C:D09
M00001653B:E09	M00001485C:B10	M00003762B:H09
M00001585A:F07	M00001457D:A07	M00001694C:F12
M00003811D:A12	M00001461A:E05	M00001678D:C11
M00001653C:F12	M00001477A:G07	M00001677D:B07
M00001679D:F06	M00001479D:H03	M00001677B:A02
M00003751D:B02	M00001482C:D02	M00001675B:H03
M00003801A:B10	M00001484D:G05	M00003808D:D04
M00003844C:A08	M00001459B:D03	M00003752B:C02
M00001636C:C01	M00001464B:C11	M00003819D:B11
M00001669C:B01	M00001511A:A05	M00001677D:B02
M00003755A:A09	M00001477B:C02	M00001694C:G04
M00003798D:H08	M00001471A:D04	M00003789C:F06
M00001444C:D05	M00001485C:H10	M00001678C:C06
M00004040B:F10	M00001485D:E05	M00001675B:D02
M00001355A:C12	M00001487C:G03	M00003750C:H05
M00001401A:H07	M00001514A:B04	M00001694A:B12
M00001393B:B09	M00001530C:G10	M00001677B:H06
M00001409D:F11	M00001534A:G06	M00001675C:G01
M00001387B:H07	M00001539A:C12	M00001675B:C01
M00001394C:C11	M00001547A:F11	M00003857B:F07
M00001344A:H07	M00001550D:A04	M00003812B:D07
M00001490C:D07	M00001460A:F07	M00001694B:B08
M00001352C:F06	M00001472C:A01	M00001677B:E06
M00001476D:G03	M00001481B:A07	M00004037A:E04
M00001399C:D09	M00001456D:F05	M00003870A:H01
M00001347C:G08	M00001456D:G11	M00003842C:D11
M00001453D:G12	M00001477D:F10	M00003828B:F09
M00001382A:F04	M00001481A:G06	M00003856C:H09
M00001392D:H04	M00001464A:B03	M00003851A:C10
M00001429C:G12	M00001469A:G11	M00003841C:E04
M00001454A:C11	M00001478B:D07	M00003837C:G08
M00001517B:G08	M00001473A:C11	M00003828B:E07
M00001535A:D02	M00001457A:G03	M00003772C:B12
M00001352A:E12	M00001669B:G02	M00001677D:F03
M00001381B:F06	M00001479D:G06	M00001678B:B12
M00004117A:D11	M00001473D:B11	M00001678D:G03
M00004217C:D03	M00001475A:A12	M00001675C:F01
M00004270A:F11	M00001460A:G07	M00003809A:H04
M00003996A:A06	M00001464A:D03	M00003771D:G05
M00004056B:D09	M00001473D:G01	M00001678A:F05
M00004142A:B12	M00001476D:C05	M00001677B:B06
M00001396D:B03	M00001484A:A10	M00003794A:E12
M00001370D:E12	M00001457C:F02	M00003771B:E05
M00001390C:C11	M00001459B:A12	M00001678A:A11
M00003989A:H11	M00001464A:E07	M00003805B:C04
M00001426A:A09	M00001467A:B03	M00001680B:E10
M00004498D:D05	M00001514A:B08	M00001679B:H07
M00001391B:G12	M00001464A:B07	M00003904D:B12

M00001391D:D10	M00001579A:C03	M00003856C:B08
M00001376B:A02	M00001517A:G08	M00003858D:G06
M00001405B:D07	M00001530B:G09	M00003870B:F04
M00001368A:A03	M00001538A:F12	M00003871C:B05
M00001392D:B11	M00001540C:B03	M00003875A:C04
M00003900D:B10	M00001547A:F06	M00003901B:A09
M00001494B:C01	M00001550A:F07	M00003901C:D03
M00001352C:A05	M00001567B:G11	M00003904C:B06
M00001408B:G06	M00001572A:A10	M00003901C:F09
M00004252C:E03	M00001575B:G01	M00003904D:B10
M00003901C:A03	M00001487D:C11	M00003850D:H11
M00004071D:A10	M00001577B:A03	M00003902B:D06
M00001377B:H01	M00001539D:E10	M00003879A:C01
M00003939A:A02	M00001587A:F05	M00003877D:G05
M00004250D:D10	M00001560A:F03	M00003881D:C12
M00004290A:B03	M00001569B:G11	M00003903A:H09
M00003911D:B04	M00001573A:A06	M00003905A:A06
M00004128B:G01	M00001575D:A10	M00003875D:D09
M00004142A:D08	M00001583A:D01	M00003879B:A06
M00003977A:E04	M00001587A:F08	M00003823D:G05
M00004236C:D10	M00001590B:B02	M00003763A:C01
M00004388B:A08	M00001553A:E07	M00003903B:C02
M00004409B:A11	M00001560A:H06	M00003905A:E07
M00003965A:B11	M00001589C:A11	M00003867A:D12
M00003988A:E10	M00001538A:C08	M00003857C:C09
M00004138A:H09	M00001531A:H03	M00003829C:D10
M00003933C:D06	M00001548A:G01	M00003839D:E02
M00004193C:G11	M00001531A:H07	M00003841C:F03
M00004039C:C01	M00001542A:E04	M00003903D:C06
M00003924B:D04	M00001487A:F10	M00003852D:E08
M00004375C:D01	M00001503C:G05	M00003845D:A09
	M00001511A:G08	M00003824A:G10
	M00001539A:H12	M00003841C:F06
	M00001542A:F06	M00003848A:C09
	M00001549A:F01	M00003857C:F11
	M00001514A:A12	M00003816C:C01
	M00001516A:D05	M00003843A:E08
	M00001546C:C07	M00003850A:F06
	M00001549A:H11	M00003813B:A11
	M00001538A:D03	M00003855C:F10
	M00001544A:C09	M00003850D:B05
	M00001546B:F12	M00003841D:F06
	M00001550A:D09	M00003858B:G05
	M00001487B:F02	M00003854D:A12
	M00001513A:G07	M00003857C:G01
	M00001530A:F12	M00003816C:E09
	M00001538A:D12	M00003813A:G04
	M00001587A:G06	M00003850D:A05
	M00001551A:D04	
	M00001485B:C03	

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES20 ATCC No. 207067	cDNA Ref No. ES27 ATCC No. 207074	cDNA Library Ref ES28 ATCC No. 207075
	M00004076D:B09	M00003832B:E01	M00003755A:B03
	M00004092D:B11	M00003842B:D09	M00001653B:G07
	M00003981C:F05	M00003845A:H12	M00001654D:G11
	M00004031D:F05	M00003847B:G03	M00001656B:A07
	M00004097B:D03	M00003847C:E09	M00001664B:D06
	M00003986D:G07	M00003853D:G08	M00001664C:H10
	M00004033B:C02	M00003828A:E04	M00001680B:C01
	M00004037B:A04	M00003867C:H09	M00001681A:F03
	M00004092C:B12	M00003822A:F02	M00001684B:G03
	M00005140D:G09	M00003868C:H10	M00001771A:A07
	M00004897D:G05	M00003871A:A05	M00003774C:D02
	M00004960B:D12	M00003879C:G10	M00003754D:D02
	M00005134C:G04	M00003880C:F10	M00001640B:F03
	M00005139A:F01	M00003881D:D06	M00003763B:H01
	M00005176A:C12	M00003884D:G07	M00003812C:A05
	M00005178A:A07	M00003887A:A06	M00003803C:D09
	M00005212A:A02	M00003889A:D10	M00003801B:B10
	M00005229D:H07	M00003889D:B09	M00003798D:E03
	M00004115C:H04	M00003858D:F12	M00003773B:G01
	M00004687A:C03	M00003774B:B08	M00003771A:G10
	M00004900C:E11	M00001680D:D02	M00001452A:E07
	M00004695B:E04	M00001528A:F09	M00004029B:F11
	M00005134D:A06	M00003748A:B07	M00003751B:A05
	M00004103B:B07	M00001655A:F06	M00001609B:A11
	M00005177A:B06	M00003750A:D01	M00001573D:F10
	M00005178A:A08	M00003761D:E02	M00001579C:B11
	M00004104D:B05	M00003763D:E10	M00001579C:H10
	M00004117B:G01	M00003768A:E02	M00001579D:G07
	M00004900D:B10	M00003829B:G03	M00001583B:E10
	M00005134D:H03	M00003772A:D07	M00001586D:E02
	M00005173C:A02	M00001661B:C08	M00001587D:A10
	M00005177A:H09	M00003778A:D08	M00001589A:D12
	M00005178B:H01	M00003799A:D09	M00001590C:H08
	M00005216C:B09	M00003800A:C09	M00001651B:A11
	M00003826B:E11	M00003804A:H04	M00001597A:E12
	M00001596A:G06	M00003806D:G05	M00001649C:B10
	M00005100B:D02	M00003808C:B05	M00001614A:E06
	M00005137A:E01	M00003811A:E03	M00001615C:D02
	M00004119A:A06	M00003815D:H09	M00001621D:D03
	M00004891D:E07	M00003818B:G12	M00001623D:G03
	M00004958B:D01	M00003769B:D03	M00001624A:F09
	M00005102C:F09	M00001390A:A09	M00001624C:A06
	M00005136D:C01	M00001432A:E06	M00001630B:A11
	M00005174D:H02	M00001381A:D02	M00001634B:C10
	M00005177C:B04	M00001383A:G04	M00001639D:B07
	M00005218B:D09	M00001384C:E03	M00001573D:F04
	M00004102C:F03	M00001384C:F12	M00001595B:A09
	M00004114B:D09	M00001384D:H07	M00004156B:A12
	M00004119D:A07	M00001385B:F10	M00004319D:G09
	M00004895C:G05	M00001385C:H11	M00004096A:G02

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES20 ATCC No. 207067	cDNA Ref No. ES27 ATCC No. 207074	cDNA Library Ref ES28 ATCC No. 207075
	M00004235A:A12	M00001386A:C02	M00004101C:G08
	M00005134B:E01	M00001372C:F07	M00004102A:H02
	M00004115C:G03	M00001389D:G11	M00004108A:A09
	M00005175B:H04	M00001371D:G01	M00004111D:D11
	M00005214B:D11	M00001392C:D10	M00004115D:C08
	M00004102D:B05	M00001392D:H06	M00004118D:E08
	M00004115A:B12	M00001397B:B09	M00004121C:F06
	M00004119D:H06	M00001398A:G03	M00004131B:H09
	M00004897D:F03	M00001400A:F06	M00004141D:A09
	M00004960B:A09	M00001410B:G05	M00004090A:F09
	M00005134C:E11	M00001413A:F02	M00004146A:C08
	M00005138B:D12	M00001415B:E09	M00004078B:A11
	M00005176A:A05	M00001425A:C11	M00004176B:E08
	M00005214C:A09	M00001386A:D11	M00004188C:A09
	M00004102C:D01	M00001354C:B06	M00004233C:H09
	M00004960B:A08	M00001339D:G02	M00004241D:F11
	M00001476D:A09	M00001660A:C12	M00004246C:A09
	M00001572A:B06	M00001528A:A01	M00004247C:C12
	M00005217D:F12	M00001343D:C04	M00004248B:E08
	M00005233A:G08	M00001347B:E01	M00004257C:H06
	M00005236B:F10	M00001348A:D04	M00004260D:C12
	M00005259B:C01	M00001349C:C05	M00004295B:D02
	M00005254D:B08	M00001350A:D06	M00004040D:F01
	M00005259C:B05	M00001352D:C05	M00004142D:E10
	M00001575A:D06	M00001380C:E05	M00003853D:D03
	M00005259D:H08	M00001354B:B10	M00003860D:H07
	M00003813C:D08	M00001380C:F02	M00003878C:E04
	M00001530D:E06	M00001354C:C10	M00003879A:G05
	M00004891B:B12	M00001355B:G11	M00003880B:C08
	M00001596B:C11	M00001356D:F06	M00003881A:D09
	M00004300C:H09	M00001360D:E11	M00003881C:G09
	M00001486D:D12	M00001361C:H11	M00003901B:A05
	M00001585D:F03	M00001362C:A10	M00003904D:D10
	M00001596B:D09	M00001363C:H02	M00003905C:G10
	M00001570D:E06	M00001366D:G02	M00003906B:F12
	M00001582C:E01	M00001369A:H12	M00003909A:H04
	M00001586C:E06	M00001352D:D02	M00004091B:D11
	M00001593B:D10	M00001485D:B10	M00003963A:E03
	M00001595C:H11	M00001457B:E03	M00004353C:H07
	M00001596B:H05	M00001457C:C12	M00003919A:A10
	M00001576A:C11	M00001458C:E01	M00003938A:B04
	M00001596C:F09	M00001462B:A10	M00003939C:F04
	M00001567A:H05	M00001464D:F06	M00003946D:C11
	M00001585D:D11	M00001467D:H05	M00003979A:F03
	M00004688A:A02	M00001468B:H06	M00003985C:F01
	M00004927A:E06	M00001505C:H01	M00003997B:G07
	M00005229D:H09	M00001470A:H01	M00003860D:A01
	M00004117B:A12	M00001457A:B07	M00004035A:A04
	M00004187D:G09	M00001479B:A01	M00004042D:H02
	M00005173B:F01	M00001469D:D02	M00004073B:B01

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES20 ATCC No. 207067	cDNA Ref No. ES27 ATCC No. 207074	cDNA Library Ref ES28 ATCC No. 207075
	M00005218A:G05	M00001487A:A05	M00003946A:H10
	M00004118A:H08	M00001352C:H02	M00001423D:A09
	M00005134A:D11	M00001488D:C10	M00004314B:G07
	M00005176C:C09	M00001490C:C12	M00001405D:D11
	M00005230D:F06	M00001493B:D09	M00001408A:H04
	M00005234D:B04	M00001504D:D11	M00001408D:D04
	M00005101C:E09	M00001376B:C06	M00001411D:F05
	M00004206A:E02	M00001506B:D09	M00001412A:E04
	M00001570C:A05	M00001511B:C06	M00001413A:F03
	M00005231A:H04	M00001476B:F10	M00001417B:C04
	M00005235A:A03	M00001450D:D04	M00001417D:A04
	M00004118B:B04	M00001433A:G07	M00001418B:F07
	M00005136D:D06	M00001470C:B10	M00001419D:C10
	M00005231C:B01	M00001437D:C04	M00001402B:F12
	M00004153B:B03	M00001447C:C01	M00001423A:G05
	M00004897C:D06	M00001448B:F06	M00001401C:H03
	M00005136D:G06	M00001449D:A06	M00001423D:D12
	M00005212B:A02	M00001433B:H11	M00001424B:H04
	M00005232A:C10	M00001451D:C10	M00001428B:A09
	M00004692A:H10	M00001452A:C07	M00001430A:A02
	M00005101C:B09	M00001453C:A11	M00001432D:F05
	M00004144A:F04	M00001456B:C09	M00001438B:B09
	M00003852B:D11	M00001454B:G03	M00001445B:E04
	M00001660D:E05	M00001454B:G07	M00001445C:A08
	M00003808A:F09	M00001454C:C08	M00001446C:D09
	M00001656A:D10	M00001454C:F02	M00001448A:G09
	M00001671A:H06	M00001454D:D06	M00001449C:H12
	M00003809C:H07	M00001456B:F10	M00001422C:F12
	M00003853C:C06	M00001455D:A09	M00001352C:H10
	M00003860A:A08	M00001455D:A11	M00004375A:H01
	M00003822B:D08	M00001448D:F09	M00004380B:A05
	M00003845A:E12		M00004444B:D11
	M00003854C:C02		M00001338B:E02
	M00003860B:G09		M00001341A:F12
	M00003822B:G01		M00001344A:G07
	M00001670A:C11		M00001345A:G11
	M00003852A:B03		M00001345B:E10
	M00003829D:A11		M00001345C:B01
	M00003854C:F01		M00001346B:B07
	M00003856B:C04		M00001405B:E09
	M00003905A:H11		M00001352B:F04
	M00001530A:F11		M00001451C:E01
	M00003840B:E07		M00001361A:H07
	M00003905B:G03		M00001362B:H06
	M00003840B:E08		M00001372C:G12
	M00003855A:C12		M00001375B:G12
	M00003905B:H05		M00001376A:C05
	M00003826B:B04		M00001376B:A08
	M00003851C:B06		M00001377C:E12
	M00003853B:C08		M00001382B:F12

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES20 ATCC No. 207067	cDNA Ref No. ES27 ATCC No. 207074	cDNA Library Ref ES28 ATCC No. 207075
	M00003829A:F03		M00001385A:F12
	M00001638C:G01		M00001394A:E04
	M00003845D:B02		M00001395A:C09
	M00001653D:G07		M00001396A:H03
	M00001578B:A02		M00001350B:G11
	M00001590B:H10		
	M00001595C:A09		
	M00001596A:E07		
	M00001607A:B06		
	M00001607A:D10		
	M00001652C:B09		
	M00001671B:F02		
	M00001632C:D08		
	M00001638C:H07		
	M00001652D:B09		
	M00001614C:E11		
	M00001633B:B11		
	M00001651C:A04		
	M00001639D:G12		
	M00001671C:F11		
	M00001638A:B04		
	M00001637C:H12		
	M00001669B:H06		
	M00001639D:F02		
	M00001590A:C08		
	M00001636A:C02		
	M00001614A:A04		
	M00C01639D:G06		

Table 23. Library Deposited on January 22, 1999

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES29 ATCC No. 207076	cDNA Library Ref ES30 ATCC No. 207077
Clone Names in Library	M00001449D:B01	M00001594D:B08
	M00001476D:F03	M00001593A:B07
	M00001456C:B12	M00001594A:C01
	M00001469B:B01	M00001594A:D08
	M00001471A:B04	M00001594A:G09
	M00001472A:D08	M00001595C:B05
	M00001473A:A07	M00001594B:F12
	M00001473C:D09	M00001596D:E03
	M00001475B:C04	M00001594D:C03
	M00001475C:G11	M00001592C:F11
	M00001476A:D11	M00001590D:G07
	M00001476B:D10	M00001595D:A04
	M00001468A:C05	M00001595D:G03
	M00001476C:C11	M00001601A:A06
	M00001467A:H07	M00001590C:F10
	M00001477B:E02	M00001589B:B08
	M00001478B:H08	M00001589C:E06
	M00001479C:E01	M00001611B:A05
	M00001480A:D03	M00001601A:E02
	M00001480C:A05	M00001587A:D01
	M00001481A:H08	M00001591B:B12
	M00001481B:D09	M00001590B:G08
	M00001482A:H05	M00001592C:E05
	M00001482D:H11	M00001591B:B06
	M00001483C:G09	M00001591D:C07
	M00001485A:C05	M00001591D:F06
	M00001476B:F08	M00001592A:E02
	M00001460A:E11	M00001592A:H05
	M00001456C:C11	M00001592B:A04
	M00001457A:C05	M00001587A:B10
	M00001457A:G12	M00001609D:G10
	M00001458A:A11	M00005231D:B09
	M00001458C:D10	M00001614B:E08
	M00001458D:A01	M00005217C:C01
	M00001458D:A02	M00001587A:B01
	M00001458D:C11	M00001613D:B03
	M00001458D:D01	M00001613A:F03
	M00001459B:C11	M00001611C:H11
	M00001468A:H10	M00001611C:C12
	M00001460A:C10	M00001611B:E06
	M00001485B:F05	M00001611B:A09
	M00001460A:H11	M00001610D:D05
	M00001461A:F05	M00001610B:C07
	M00001462A:D03	M00001610C:E07
	M00001464A:B02	M00001610A:E09

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES29 ATCC No. 207076	cDNA Library Ref ES30 ATCC No. 207077
	M00001464A:E10	M00001601A:E12
	M00001465A:B12	M00001609B:C09
	M00001465A:C12	M00001608D:D11
	M00001465A:E10	M00001608B:A09
	M00001465A:G06	M00001607D:F06
	M00001466A:F08	M00001607B:C05
	M00001467A:C10	M00001606A:H09
	M00001460A:B12	M00001605A:H03
	M00001545A:B12	M00001605A:E09
	M00001535A:D10	M00001605A:A06
	M00001536A:F11	M00001604A:C11
	M00001537A:H05	M00001604A:C07
	M00001539A:E01	M00001604A:B08
	M00001539A:H02	M00001604A:A09
	M00001539B:G07	M00001610A:H05
	M00001539D:B10	M00005214B:A06
	M00001540D:E02	M00005228A:A09
	M00001541B:E05	M00001567A:B09
	M00001542A:G12	M00001561A:D01
	M00001485B:D09	M00001559A:C08
	M00001545A:B10	M00001559A:A11
	M00001533A:G05	M00001558A:G09
	M00001545A:F02	M00001555A:B12
	M00001545A:G05	M00001554A:A08
	M00001546A:D08	M00001552A:H10
	M00001548A:H04	M00001552A:F06
	M00001550A:E07	M00005231C:B07
	M00001551A:A11	M00005218D:G10
	M00001551A:D06	M00001570A:H01
	M00001551A:H06	M00005214D:D10
	M00001551D:H07	M00001570C:G03
	M00001552A:E10	M00005213C:A01
	M00001450A:B08	M00005212D:F08
	M00001544A:F05	M00005212A:D10
	M00001512A:G05	M00005211C:E09
	M00001483B:D04	M00005211A:E09
	M00001485B:H03	M00005210D:C09
	M00001485C:C08	M00005179D:B03
	M00001486B:D07	M00005179B:H02
	M00001486B:E12	M00005177D:F09
	M00001487B:A11	M00005177C:G04
	M00001487B:E10	M00005177B:H02
	M00001507A:A11	M00001614D:B08
	M00001507A:B02	M00001615A:D06
	M00001507A:C05	M00005216B:D02
	M00001507A:E04	M00001579C:A01

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES29 ATCC No. 207076	cDNA Library Ref ES30 ATCC No. 207077
	M00001534A:D03	M00001585B:C03
	M00001511A:G01	M00001585B:A06
	M00001533D:A08	M00001584D:H02
	M00001513A:F05	M00001584A:G03
	M00001514A:G03	M00001583D:B08
	M00001516A:D02	M00001583B:F02
	M00001516A:F06	M00001583A:F07
	M00001517A:B11	M00001583A:A05
	M00001529D:C05	M00001582D:F02
	M00001530A:A09	M00001582D:B01
	M00001530A:E10	M00001582A:A03
	M00001532A:C01	M00001579D:H09
	M00001532D:A06	M00001567D:B03
	M00001485B:D10	M00001579C:H06
	M00001511A:A02	M00001585B:F01
	M00004249D:B08	M00001579B:F04
	M00004185D:E04	M00001579A:E03
	M00004188D:G08	M00001578C:F05
	M00004197C:F03	M00001577D:H06
	M00004198B:D02	M00001577B:F10
	M00004204D:C03	M00001576C:G05
	M00004208B:F05	M00001575D:D12
	M00004208D:B10	M00001575D:B10
	M00004210B:B05	M00001575D:A02
	M00001362D:H01	M00001573B:G08
	M00004216D:D03	M00001573A:E01
	M00004167A:H03	M00001572A:B05
	M00004275A:B03	M00001571D:F05
	M00004285C:A08	M00001579D:F04
	M00004316A:G09	M00001636A:F08
	M00004465B:D04	M00001643B:E05
	M00004493B:D09	M00001642C:G02
	M00001347B:H04	M00001642A:F03
	M00001351C:B06	M00001641D:C04
	M00001360A:G10	M00001641C:H07
	M00004216D:C03	M00001641C:F01
	M00004076D:D04	M00001641C:D02
	M00001484C:A04	M00001641B:F12
	M00001456B:G01	M00001634A:B04
	M00003972D:C09	M00001636B:G11
	M00003974C:E04	M00001649C:D05
	M00003979A:E11	M00001636A:C03
	M00003983C:F03	M00001635D:D05
	M00003989B:F11	M00001635D:C12
	M00004031D:B05	M00001635B:H02
	M00004177C:A01	M00001635B:H01

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES29 ATCC No. 207076	cDNA Library Ref ES30 ATCC No. 207077
	M00004076B:G03	M00001634D:G11
	M00004167D:A07	M00001634D:D04
	M00004078A:A06	M00001634A:H05
	M00004085A:B02	M00001641A:A11
	M00004107B:A06	M00001638B:E12
	M00004111C:E11	M00001640A:H02
	M00004130D:H01	M00001614C:E06
	M00004157D:B03	M00001636D:F09
	M00004159C:F09	M00001637A:A03
	M00004162C:A07	M00001637A:A06
	M00004135B:G01	M00001637A:E10
	M00004040A:G12	M00001637A:F10
	M00001453B:H12	M00001637C:C06
	M00001448A:E11	M00001644A:H01
	M00001448B:F09	M00001638B:E03
	M00001448B:H05	M00001649A:E11
	M00001448C:E11	M00001638B:F10
	M00001448C:F10	M00001639A:C03
	M00001448D:F12	M00001639A:G07
	M00001449B:B03	M00001639B:H01
	M00001449C:C05	M00001639B:H05
	M00001449D:G10	M00001639C:A09
	M00001448A:B12	M00001639C:C02
	M00001453A:D08	M00001649C:E11
	M00001451B:A04	M00001649C:H10
	M00001454A:F11	M00001637C:E03
	M00001454A:G03	M00001617A:A08
	M00001455A:F04	M00001622A:H12
	M00001455B:E07	M00001621C:H12
	M00001455D:A06	M00001621B:G05
	M00001364B:B06	M00001620D:H02
	M00004117A:G01	M00001620D:G11
	M00001455D:D11	M00001619D:D10
	M00001456B:A06	M00001619C:C07
	M00001451A:C10	M00001619A:E05
	M00001395A:E03	M00001623A:F04
	M00001366D:C06	M00001618A:A03
	M00001365A:H10	M00001618B:D09
	M00001366D:C12	M00001617A:A01
	M00001373D:B03	M00001616D:C11
	M00001453B:F08	M00001615C:G05
	M00001444D:C01	M00001615C:A11
	M00001375B:C06	M00001615B:G07
	M00001392C:D05	M00001633D:H06
	M00001395A:A12	M00001639C:A10
	M00001395A:H02	M00001615B:A09

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES29 ATCC No. 207076	cDNA Library Ref ES30 ATCC No. 207077
	M00001397D:G08	M00001615B:G01
	M00001434A:B10	M00001618A:F10
	M00001416A:D09	M00001632C:H07
	M00001433C:F10	M00001633D:D12
	M00001416A:H02	M00001633D:D09
	M00001428D:B10	M00001618A:F08
	M00001428B:D01	M00001633D:G09
	M00001426D:D12	M00001624A:A03
	M00001400C:D02	M00001633C:F09
	M00001427C:D01	M00001633C:H05
		M00001633C:B09
		M00001633A:E06
		M00001633C:H11
		M00001632C:B10
		M00001625D:G10
		M00001631D:G05
		M00001629C:E07
		M00001629B:B08
		M00001626C:E04
		M00001626C:C11
		M00001632A:B10
		M00001624B:B10
		M00001633C:A05
		M00001625C:G05

Table 24. Cl nes Deposited on January 22, 1999

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES31 ATCC No. 207078	cDNA Ref No. ES32 ATCC No. 207079	cDNA Library Ref ES33 ATCC No. 207080
Clone Names in Library	M00003843A:E04	M00003906A:F12	M00005254D:A10
	M00003842C:G03	M00003906B:H06	M00005260B:E11
	M00003842A:A03	M00003906C:C05	M00005260A:F04
	M00003841D:A04	M00003907A:F01	M00005260A:A12
	M00003841B:E06	M00003907B:C03	M00005259B:D12
	M00003841C:H11	M00003907B:D05	M00005257D:H11
	M00003844A:A11	M00003918A:D08	M00005257D:G07
	M00003841C:F01	M00003918A:F09	M00005257D:A06
	M00003841C:H08	M00003918C:H10	M00005257C:G01
	M00003841C:D07	M00003924A:D08	M00005257A:H11
	M00003844D:A07	M00003958B:E11	M00005236B:H10
	M00003845D:G08	M00003958B:H08	M00005236B:G03
	M00003852C:B06	M00003960A:G07	M00005257C:E05
	M00003854B:A07	M00003971B:A10	M00001608C:D02
	M00003854B:D04	M00003972D:H02	M00001608C:G04
	M00003859D:C05	M00003973C:C03	M00001608D:F11
	M00003860B:F11	M00003974B:B11	M00001609C:A12
	M00003867B:G07	M00003974D:F02	M00001609C:G05
	M00003867B:G08	M00003974D:H04	M00001610C:B07
	M00003841B:E03	M00003975C:F07	M00001612D:D12
	M00003822D:B10	M00003977C:A06	M00001612D:F06
	M00003867D:A06	M00003977C:B03	M00001613A:D02
	M00003868B:G06	M00003977D:A03	M00001614A:B10
	M00003867B:D10	M00003977D:A06	M00001614C:G07
	M00003831C:G05	M00003977D:D04	M00001615C:E07
	M00003901C:B01	M00003978D:G04	M00001625C:F10
	M00003868C:C07	M00003980A:F04	M00001626D:A02
	M00003820A:A08	M00003980B:C11	M00001629A:H09
	M00003820B:D07	M00003981C:B04	M00001629D:B10
	M00003820B:D10	M00003982A:B12	M00001629D:D10
	M00003822D:C06	M00003982C:G04	M00001630C:F09
	M00003823B:F07	M00003984D:B08	M00001631A:D03
	M00003824C:D07	M00003985B:G04	M00001631A:F06
	M00003825B:B10	M00003985D:E10	M00001631A:F12
	M00003825B:B11	M00003986B:A08	M00001631B:H04
	M00003828A:D05	M00003986C:D09	M00001633A:F11
	M00003822D:D04	M00003986D:C08	M00001633A:G10
	M00003830C:A03	M00003987B:E12	M00001633B:A12
	M00003840D:H10	M00003987B:F08	M00001633B:E03
	M00003832A:A09	M00003987C:G03	M00001633C:A08
	M00003833B:B03	M00003988D:A08	M00001633C:E12
	M00003833B:C12	M00003989C:D03	M00001635B:B02
	M00003834B:G04	M00003989C:G05	M00001636A:H12
	M00003835A:A09	M00003989D:F12	M00001638A:C08
	M00003835B:H11	M00004029B:F01	M00001638B:C08
	M00003835D:G06	M00004029C:C05	M00001639D:C12
	M00003837C:E05	M00004029C:G10	M00001640A:F05
	M00003837C:F10	M00004030D:F11	M00001642D:G08

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES31 ATCC No. 207078	cDNA Ref No. ES32 ATCC No. 207079	cDNA Library Ref ES33 ATCC No. 207080
	M00003839A:D07	M00004034A:A01	M00001647D:G07
	M00003839D:E11	M00004034C:G02	M00001649A:E10
	M00003829C:H05	M00004034D:E09	M00001650D:D10
	M00003901B:C03	M00004035B:H09	M00001650D:F11
	M00003878C:F06	M00004036D:B04	M00001651C:D11
	M00003878C:G08	M00004036D:B09	M00001651C:G12
	M00003879A:A02	M00004038A:F02	M00001652B:D06
	M00003879A:B08	M00004038D:G06	M00001652D:G02
	M00003879A:C11	M00004039A:C03	M00001652D:G06
	M00003879A:D02	M00004039A:H11	M00001653A:A05
	M00003879B:G02	M00004039B:A05	M00001653D:H07
	M00003880B:D11	M00004039B:E12	M00001654A:E08
	M00003880C:E11	M00004040C:A01	M00001654B:A01
	M00003880C:H03	M00004051D:E01	M00001654C:D10
	M00003901B:F10	M00004072D:F09	M00001654C:G07
	M00003890B:C08	M00004073A:D10	M00001654C:G09
	M00003877C:A11	M00004075B:G09	M00001655C:C07
	M00003819D:B01	M00004076A:D12	M00001655D:E08
	M00003901B:G11	M00004076D:H07	M00001655D:H11
	M00001692A:G06	M00004078A:C11	M00001656A:H12
	M00003903C:C05	M00004078A:E05	M00001656C:C04
	M00003903C:E12	M00004078A:F07	M00001656D:C04
	M00003903D:C12	M00004078B:C11	M00001657C:C11
	M00003903D:D10	M00004078B:F12	M00001657D:A10
	M00003903D:H11	M00004079D:G08	M00001659D:A09
	M00003904A:C04	M00004081A:E02	M00001661D:D05
	M00003904B:C03	M00004081A:G01	M00001664B:E08
	M00003904C:A08	M00004081C:A10	M00001664B:F06
	M00003881B:F10	M00004083A:E08	M00001669B:C12
	M00003871D:G06	M00004083B:C01	M00001669C:B09
	M00003868D:D09	M00004086D:G08	M00001670A:F09
	M00003868D:D11	M00004087B:A12	M00001678C:F09
	M00003870C:A01	M00004087C:A01	M00001693A:H06
	M00003870C:A10	M00004088C:F01	M00003805D:E06
	M00003870C:E10	M00004088D:A11	M00003806C:A06
	M00003871A:A02	M00004088D:B05	M00003809B:A03
	M00003871A:B09	M00004088D:B10	M00003810A:A02
	M00003871A:C11	M00004090B:B04	M00003810B:B11
	M00003871A:G09	M00004090B:H06	M00003810C:B06
	M00003871C:E04	M00004092B:E05	M00003810D:H09
	M00003871C:F12	M00004093C:C02	M00003811C:C02
	M00003878C:D08	M00004096D:H03	M00003813B:F02
	M00003871D:E11	M00004099D:F01	M00003813C:H08
	M00003877C:G12	M00004100B:C07	M00003813D:B12
	M00003875A:A07	M00004103B:E09	M00003813D:C02
	M00003875A:B01	M00004105C:B05	M00003813D:G06
	M00003875B:F12	M00004105C:C08	M00003814B:C01
	M00003875C:A01	M00004107A:A12	M00003817C:A10
	M00003875C:A09	M00004107B:D07	M00003817C:G06
	M00003875C:G02	M00004108B:B02	M00003817D:D12

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES31 ATCC No. 207078	cDNA Ref No. ES32 ATCC No. 207079	cDNA Library Ref ES33 ATCC No. 207080
	M00003876B:C05	M00004108D:E07	M00003821A:H09
	M00003876C:D02	M00004108D:G04	M00003822B:G12
	M00003876C:F02	M00004110A:A10	M00003822C:A07
	M00003877B:H10	M00004110B:A07	M00003823C:B01
	M00003868D:B09	M00004118B:A03	M00003823C:C04
	M00003871D:A10	M00004118B:F01	M00003824A:G11
	M00001669D:D06	M00004118D:B05	M00003824B:C09
	M00001661A:B11	M00004119A:C09	M00003824C:A10
	M00001661B:F06	M00004136D:B02	M00003824D:D08
	M00001662A:C07	M00004137A:D06	M00003825B:F10
	M00001662A:G01	M00004139C:A12	M00003825D:F01
	M00001662B:F06	M00004149C:B02	M00003826C:F05
	M00001663C:F12	M00004159C:G12	M00003829A:B08
	M00001664A:F08	M00004169D:B11	M00003829C:E08
	M00001664D:F04	M00004187D:H06	M00003829D:D12
	M00001661A:E06	M00004228C:H03	M00003829D:F03
	M00001669A:B02	M00004244C:G07	M00003830D:B11
	M00001669B:B12	M00004358D:C02	M00003830D:H11
	M00001669C:C08	M00004690A:G08	M00003833D:H08
	M00001675A:G10	M00004891B:D01	M00003833D:H10
	M00001669D:C03	M00004891C:D04	M00003840A:C10
	M00001660B:E03	M00004895B:E12	M00003840B:F05
	M00001669D:F05	M00004895B:G04	M00003840C:C02
	M00001670B:G12	M00004895D:G07	M00003845C:D04
	M00001671A:A10	M00004898C:F03	M00003845D:A04
	M00001671B:G05	M00004899D:G06	M00003846B:C05
	M00001671C:C11	M00004959D:H12	M00003846C:F08
	M00001672D:E08	M00004960A:B08	M00003848B:E07
	M00001673A:G08	M00004960C:E10	M00003848D:G02
	M00001673B:B07	M00005100A:B02	M00003850C:G09
	M00001673B:F07	M00005100A:C01	M00003851A:A06
	M00001673D:D06	M00005101C:E12	M00003851B:D03
	M00001673D:F10	M00005102C:D03	M00003851B:E01
	M00001674A:G07	M00005134B:E08	M00003851C:F09
	M00001692D:B01	M00005139A:H03	M00003851D:H11
	M00001669C:D09	M00005140C:B10	M00003852B:G04
	M00001655C:E01	M00005140D:C06	M00003852C:F07
	M00001649D:A08	M00005178D:H04	M00003853B:C10
	M00001650A:C11	M00005210A:E06	M00003854C:C09
	M00001651A:H11	M00005212B:E01	M00003855A:A01
	M00001652A:A01	M00005212C:C03	M00003855A:F01
	M00001652B:G10	M00005212C:D02	M00003855B:B09
	M00001652D:E05	M00005212C:H02	M00003856A:G04
	M00001652D:E09	M00005212D:D09	M00003856B:A12
	M00001653B:C06	M00005212D:H01	M00003857A:E12
	M00001653B:G10	M00005216A:D09	M00003857A:H10
	M00001653C:D10	M00005216A:H01	M00003857C:E05
	M00001654D:A03	M00005217B:A06	M00003858B:G02
	M00001654D:E12	M00005218A:F09	M00003860D:E06
	M00001654D:F11	M00005228A:B03	M00003905C:F12

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES31 ATCC No. 207078	cDNA Ref No. ES32 ATCC No. 207079	cDNA Library Ref ES33 ATCC No. 207080
	M00001660C:B06	M00005228C:C05	M00003911A:D12
	M00001658D:G12	M00005229B:G12	M00003966B:A04
	M00001675C:A04	M00005229B:H04	M00003966C:A12
	M00001660B:D03	M00005229B:H06	M00003966C:F03
	M00001660B:A09	M00005229D:H03	M00003973D:F08
	M00001659D:C09	M00005230B:H09	M00003974D:E01
	M00001659D:B05	M00005232A:H12	M00003974D:H07
	M00001654D:F12	M00005233B:D04	M00003976B:E06
	M00001659A:D12	M00005233D:H07	M00003976B:H07
	M00001655A:B11	M00005235B:F10	M00003978A:E01
	M00001658B:A07	M00005236A:E04	M00003978A:E09
	M00001658A:G09	M00005236A:G10	M00003978C:A12
	M00001657D:A04	M00005236B:A12	M00003980C:E12
	M00001657B:B04	M00001448B:A07	M00003980C:F12
	M00001656B:E01	M00001448B:G07	M00003981A:A07
	M00001660B:E04	M00001448D:E11	M00003981B:B12
	M00001659C:F10	M00001455A:D10	M00003982A:G03
	M00003808C:A05	M00001455A:E11	M00003982B:C10
	M00001694D:C12	M00001476D:F12	M00003982B:H10
	M00003746C:E02	M00001478A:F12	M00003983A:D02
	M00003779D:E08	M00001482C:F09	M00003983A:F06
	M00003792A:B10	M00001485C:D07	M00003983A:G02
	M00003793D:A11	M00001485C:G06	M00003983D:E08
	M00003794D:G03	M00001485D:A05	M00003983D:H02
	M00003797A:C11	M00001487C:A11	M00003985A:C01
	M00003797A:D06	M00001487C:G09	M00003986C:G11
	M00003797A:G03	M00001530A:B02	M00003986D:H12
	M00003800B:F03	M00001530A:H05	M00004027A:A08
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	M00003806B:C09	M00001539B:B10	M00004028A:G03
	M00001674A:G11	M00001567A:C04	M00004029B:A01
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	M00001693D:E08	M00001567C:B08	M00004029B:G10
	M00003808D:D08	M00001567C:E07	M00004029C:F02
	M00003809A:C01	M00001570C:B02	M00004029C:F05
	M00003809A:F01	M00001570D:E05	M00004030B:A12
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	M00003809B:E10	M00001573B:A06	M00004030C:A08
	M00003813A:B02	M00001573B:H12	M00004030C:C02
	M00003813A:D08	M00001575A:D05	M00004034C:F05
	M00003813B:E09	M00001575B:C01	M00004035B:F05
	M00003814B:C12	M00001576C:H02	M00004036A:A11
	M00003814B:F12	M00001577A:A03	M00004037C:D04
	M00003815C:C06	M00001578B:A06	M00004038A:E05
	M00003815C:D12	M00001579D:F02	M00004038B:D01
	M00003817B:C04	M00001582C:C04	M00004039C:E02
	M00003806B:G05	M00001582C:G02	M00004039D:B10
	M00001679A:D10	M00001584A:A07	M00004040A:A07
	M00001675C:C03	M00001584D:B06	M00004040A:B04
	M00001675C:D12	M00001584D:C11	M00004040A:C08

cDNA Ref No.; ATCC Accession No.	cDNA Library Ref ES31 ATCC No. 207078	cDNA Ref No. ES32 ATCC No. 207079	cDNA Library Ref ES33 ATCC No. 207080
	M00001675D:E10	M00001585D:B12	M00004040B:C05
	M00001676B:B09	M00001586C:H07	M00004040B:F07
	M00001676B:E01	M00001589D:A01	M00004069A:E12
	M00001676C:A04	M00001590D:B04	M00004069C:C08
	M00001676C:E07	M00001592B:B02	M00004077A:G12
	M00001676D:A02	M00001592D:H02	M00004085B:G01
	M00001676D:B02	M00001594C:E05	M00004087A:B05
	M00001677A:G11	M00001594C:H03	M00004090D:F12
	M00001677B:A12	M00001594D:G11	M00004092C:D08
	M00001677B:B04	M00001595A:C07	M00004097C:E03
	M00001677D:B01	M00001595A:D12	M00004097C:H08
	M00001678D:B11	M00001595A:E07	M00004097D:B05
	M00001681C:A08	M00001595B:G07	
	M00003819B:G01	M00001595B:G10	
	M00001693C:E09	M00001595B:H11	
	M00001693C:C12	M00001595C:A01	
	M00001692B:E01	M00001595C:A05	
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	M00001681D:C12	M00001595C:E09	
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	M00001680B:D02	M00001596A:A02	
	M00001680A:B02	M00001596A:D01	
	M00001679D:F02	M00001596C:G05	
	M00001679D:B02	M00001607A:A01	
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